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ABSTRACT

The paper reviews current efforts in early identification and provision of services to the hearing impaired in Pakistan and discusses possible strategies over the next 10 years in rural areas which currently offer no services. Needs in the area of preschool identification and intervention are identified and include proper assessment, appropriate hearing aids, home training by parents, and parent-professional collaboration. Since special schools and professional services could not begin to meet the needs of the hearing impaired, the author recommends locally based programs utilizing normal schools and the parents of the hearing impaired. It is suggested that even a few parents could form an association and pool their resources so that their children can be properly assessed, hearing aids purchased, and a local technician trained in hearing aid servicing. It is thought that such a group would serve as an example of what can be done through local self help groups to improve the lot of hearing impaired children. Foreign technical assistance is seen as providing pump priming, organizational help, and technical development of appropriate hearing aids and audiometers. (DB)

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HEARING IMPAIRED CHILDREN IN RURAL PAKISTAN : CONSTRAINTS, PRIORITIES AND ACTION

This paper reviews current efforts for rehabilitation of the hearing impaired in Pakistan and discusses possible strategies over the next ten years for rural towns where at present no facilities exist. The technical requirements for pre-school intervention are examined, i.e. screening/identification; assessment; appropriate hearing aids; home training by parents; parent-professional collaboration.

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Introduction

What are the priority goals and technical needs for a development policy which would be inexpensive by local standards, replicable in rural towns, and would give significant assistance to children with congenital or adventitious hearing impairment in Pakistan in the next ten years ? A target coverage of 50% might be a realistic aim, between the present plight of the villages where no facilities exist for any of the hearing impaired, and expectations for the city where sophisticated facilities may be (or shortly become) available for all degrees of impairment. The next decade is a viable planning period, and may see some progress in development of appropriate technology and amelioration of public attitudes.

With physically, mentally or visually handicapped persons, much rehabilitation can be achieved with little technology given the cooperation of the handicapped person and some degree of rehabilitation/special education skill. With hearing impairment this is much less the case. The important relationship between the handicapped person and rehabilitation agents is channelled in most cases of physical, mental or visual handicap through spoken language. That is often not possible in the early stages of rehabilitation of the hearing impaired, i.e. babies aged 0 - 3 years. The absence or failure in development of normal linguistic abilities constitutes both a major obstacle to rehabilitative education and a major target for action.

Western advisors and teachers of the hearing impaired are not generally ready for a situation in which hearing aids are unavailable. When asked what can be done for deaf children in rural Pakistan where sophisticated technology neither is available nor would be correctly maintained, their usual suggestion is to remove those children to a centre where the technology can be 'applied' to them. This however creates other problems : 1) the socio-psychological trauma of transferring young children from their rural homes to a city residential centre; 2) insufficient places available for more than a small proportion of hearing impaired children ; 3) the child will probably receive instruction in a language other than its mother tongue; 4) in practice by the time the impairment is recognised much of the child's language-learning potential has been lost.

The Current Position

Children born with or suffering hearing impairment during 1982 in rural areas have little prospect of getting significant help from facilities currently available. It is unlikely they will be diagnosed at an early age, or be fitted with hearing aids, or that if fitted the aids will be for the appropriate frequency range and will be properly set and maintained. It is unlikely that measures will be taken to stimulate linguistic development, or even that normal development will be maintained in other areas of the child's growth. Such benefits are confined to a small number of children in a few big cities where

there are some E.N.T. specialists, some aids available, a few technicians, some so-called 'schools for deaf and dumb', and a few welfare organisations for the deaf.

Staff of the city facilities are largely preoccupied with doing their current work, trying to obtain equipment and better premises, taking part in the oral/manual debate, campaigning to be paid a living wage, or arranging to work or train overseas. Those few who have returned to Pakistan after experience abroad are for the most part disillusioned and depressed by the obstacles to developing appropriate facilities. Some have brought equipment back with them for which servicing facilities are not available, or which has suffered in the heat and humidity, or which has rapidly been broken by users unaccustomed to machinery more subtle than a buffalo cart.

A similar situation exists in many developing countries. If any significant advances have been made in appropriate technology or low-cost methods for relief of hearing impairment they have neither been well publicised nor have penetrated to the point of mass production and distribution. The hearing impaired have little political or economic clout, especially in countries with no competent adult advocates who are themselves hearing impaired. Where there is high unemployment, under-employment, and general powerlessness among the non-handicapped population difficulties will be exacerbated. The hearing impaired readily escape the notice even of international bodies like UNICEF in South East Asia and Pakistan region, which has just produced a follow-up kit entitled "Beyond the International Year of Disabled Persons" totally ignoring hearing impairment in 70 pages and a dozen posters dealing with handicapped children. Deafness rightly has been called the invisible handicap.

No reliable statistics exist for the prevalence of hearing impairment among Pakistani children. It may safely be assumed that both conductive and sensorineural deafness are at least as common as in Europe. The low level of hygiene, low resistance to disease, high prevalence of respiratory disease, meningitis and other acute infections, the cloak of silence around venereal diseases, as well as faulty obstetric practices and failure to give adequate treatment for neonatal jaundice and for rhesus incompatibility, are specific parts of the overall poor health background which would increase the chances of hearing impairment.

Hearing loss is often not noticed by parents, especially of young children. A child may be stone deaf in one ear and suffering a moderate loss in the other, but to parents whose categories include only "deaf" or "not deaf" the fact that the child responds to some sounds means that he is "not deaf". The child may in fact be severely handicapped, but will not be reported as "deaf" to any survey investigator or census enumerator. Even when parents recognise impairment they may conceal it both from outsiders and from themselves. The handicapped child often causes a deep psychological wound in parents, and may also prejudice the marriageability of non-handicapped

siblings. Even without denial on the part of parents, early recognition of disability by the family poses problems in a society with high birthrate and infant mortality. Parents do not invest emotionally in their children, nor regard communicativeness as a virture, to the extent that occurs in small Western families. Poor speech development resultant from hearing impairment will therefore persist longer before being regarded as abnormal, or even being noticed at all.

Priorities

The importance of intervention at as early an age as possible with hearing impaired children is now well established. Wealthier nations are aiming to screen all babies, or at least high risk babies, by the end of their first year with medical or surgical treatment where indicated; and to introduce sound amplification devices from 1 year upwards. By these means and by training parents in home rehabilitation and hearing aid maintenance it is hoped to maintain the child's normal linguistic development, and so to compensate for the impairment that the child will in due course use normal educational facilities. Successful early intervention results in a great saving of effort later on. This trend in the more developed nations presupposes availability of the following : 1) a viable screening system; 2) testing centres with technology and trained medical, technical or paramedical personnel capable of identifying and measuring hearing impairment in babies and young children; 3) adequate supply of appropriate hearing aids; 4) facilities for aid maintenance and training parents in daily monitoring; 5) support for in-home rehabilitation, by itinerant teachers, health visitors or other community agents.

None of these is available in Pakistan. If they are not developed, the alternative is to continue in the present fashion as was done in the West 50 years ago, setting up special schools for a small proportion of deaf children. To do so involves slowly, painfully and expensively reclaiming the linguistic ground lost in the child's early years. Such schools are now being closed in the U.K. In Pakistan they could meet only a small proportion of the need, so it is worth contemplating a direct move to a locally appropriate variant of the early intervention model. The five factors outlined above will therefore be examined more closely.

Screening/Identification

In practice Birth Registration hardly exists in Pakistan. Over 90% of births take place at home, attended by traditional birth attendants. Antipathy is strong between western-style medical personnel and the indigenous system, and there is little cooperation. There is no prospect of universal hearing screening, for three reasons : a) lack of access to the babies; b) lack of skills in hearing assessment, even among qualified doctors; c) lack of awareness of the importance of early intervention. Lack of access to babies is connected with the poor status and non-literacy of women, and the purdah system in the more traditional areas of Pakistan. It is already a target for change in

health/social welfare/women's development programs, just as the lack of assessment skills and the public ignorance are targets of medical and health education programs. Selective screening might be feasible to gain access to babies born to parents with hearing problems, by registration of adult deaf persons and dissemination of propaganda at the registration point, and by media campaigns offering free assessment to babies in families with a history of deafness. Registration would be successful only if there were adequate incentive, such as preferential employment opportunities or cash benefits (which would of course be liable to abuse).

Where parents believe that something is wrong with their baby, optimistic reassurances from relatives and medical personnel generally carry them through the early years, until the damage through loss of language learning potential is practically irremediable. (It is little consolation to learn of Western research showing that some degree of damage can be reversible even years later with appropriate programs of remediation : there are no such programs in Pakistan). Almost all mothers worry at times about some aspect of their baby's behaviour or development, so that doctors and older relatives are quite accustomed to giving reassurances and later seeing the baby turn out quite normal. Those who turn out to be handicapped justify the mother's observation and worries, too late. Many hearing impaired children in Pakistan are thought to be either very naughty or "mad", because they obey their parents when they see them speaking (reading lips and non-verbal cues) but ignore them when they do not see the command. For this reason some parents refuse point-blank to believe that their child has seriously impaired hearing.

Assessment

The traditional crude tests of jangling keys and hissing behind a child's head are merely negative clues, with severe limitations. If a child fails to respond to such noises, further investigation should certainly be undertaken. Positive response indicates only that the child has some hearing at some frequencies and intensities (or could read inadvertent clues from the testers). A large gulf seems to exist between testing at this level of crudeness and tests giving results adequate for prescribing treatment or setting a modern hearing aid for one or both ears. This is particularly the case with children below three years of age, where pure tone audiometry is scarcely feasible. To get a reasonable assurance of valid results with children under three, using a series of distraction tests and cooperative performace methods, requires considerable skill, confidence and patience on the part of the assessor, over more than one session.

A series of films shown recently in Peshawar demonstrated various types of developmental screening devised by Mary Sheridan, including one film on hearing assessment in which a doctor is seen going patiently through a series of tests with children from six months upwards. Pakistani viewers commented : "Our doctors would never be so patient with a young child". "Would one of our doctors ever spend that amount of time merely testing a baby's hearing ?"

While these comments are typical of the self-denigration and inferiority complex endemic in the nation, and of perceived priorities in the health and welfare field, they cannot be dismissed. The developmental tests required little apparatus and were sufficiently straightforward for a person of normal intelligence to perform after two days' training. The viewers saw little prospect of their own medical personnel being willing to learn and follow such procedures and thus of being able to train and supervise the medical auxiliaries who would screen young children in rural areas, e.g. at MCH centres.

"It seems that everybody, be he a teacher of the Deaf, social worker or doctor, likes to have an audiometer. Whether the audiometer works or not, whether it is calibrated, whether they know how to use it, is of secondary importance. Furthermore, in most cases such audiometers are installed in very noisy conditions." This comment by a Tutor at the Deaf Education Specialist Training College, Ghana, is not yet applicable to Pakistan, simply for lack of audiometers. One may confidently predict it within the decade. The difficulty of assuring a noise-free environment may not immediately be appreciated in colder climates. For 6 months of the year electric fans are a necessity in most parts of Pakistan, which invariably give some motor and turbulence noise. An audiology centre would have to be designed with a soundproof room having a remote airconditioner, or one that could be turned off during testing. Needless to say, such conditions will rarely be obtained. Most testing will go on against some background of noise.

At present we know of only two audiometers in the North West Frontier Province, for a population of 18 million (including 2 million Afghan refugees). One is a Danish model which has not been serviced or calibrated in the past five years. The Provincial Director of Social Welfare turned up recently with a bus-stand attendant whom he desired us to test. It was a classic demonstration of crude testing. Only one side of the headphones was functioning, and during the testing procedure the functioning side unaccountably reversed. It appears that the man being tested had roughly an 80Db loss in one ear over most frequencies and 30Db loss in the other ear. However, with the anomalous behaviour of the audiometer, the usual traffic noise outside, unfamiliarity of the bus-stand attendant with the testing procedure, the absence of any means other than shouting to convey to him what was required, and some degree of conduction between one ear and the other, the imperfections of the results may be imagined. After half an hour we had reason to believe that the man was severely impaired in one ear and mildly so in the other (which in fact was fairly clear from talking to him). We had gathered nothing as to aetiology nor were we in a position to examine his ears for obstructions. The Director now knows what an audiometer is and (having tried it on himself) understands its basic operation in air conduction testing. He has decided to order one without delay. However, being a perceptive man he is at least aware that some difficulties might be encountered in testing young children.

Hearing Aids

Finding a mild hearing impairment may disclose a condition amenable to medical or surgical treatment. But given the expense and marginal effectiveness of the treatments it more often indicates a need for simple, sensible measures such as seating a mildly impaired child near the front of a classroom with the better ear towards the teacher. However, as behavioural adaptations conceal mild impairments, many cases referred for testing will disclose a condition for which a medium or high-power hearing aid would be recommended. Without adequate supply of aids and maintenance facilities there would be little point in setting up any very elaborate testing facilities.

There are three features of hearing aids, the absence or inappropriateness of any one of which would practically invalidate supply of the others : a) type and design of the aid itself; b) ear mould; c) batteries. At present in Pakistan virtually all hearing aids are imported at great cost. Adjustment and maintenance is carried out only in Karachi and Lahore. Ear mould casts can be taken in Karachi, Lahore and Rawalpindi, with the final mould manufactured in Karachi or abroad; batteries for certain types of imported aid can be obtained only on the black market; there is no training course or Urdu literature on care and maintenance of hearing aids, though the Karachi suppliers make some efforts to help users understand their aid.

a) Type and Design For practical purposes, loop induction systems and the latest electronic wizardry may be disregarded and only two types of aid be considered : the ear-level aid and the body-worn. For the suggested priority target, i.e. pre-school children, the ear-level type has the following advantages : i) absence of lead for the child to tug or to suffer defect; ii) use of batteries which decay sharply, simplifying daily monitoring routine; iii) sound reception at the appropriate place and accessible from behind, rather than on the chest, facilitating source location; iv) obviation of harness arrangement or adjustment of clothing required by body-worn type; (at least in Pakistan small children tend to be clothed much of the time, whereas in many developing countries this is not the case); v) the ear-level aid cannot so readily be dribbled on or have food spilled into it, and thus needs no cover.

Apparently ear-level aids are seldom used with small children because the ear does not readily support their weight, and the receiver is too easily displaced. However, positioning is not an insuperable problem. If the advantages over body-worn aids are sufficient it would be possible to devise a small, comfortable strap using broad elastic tape and velcro fastners encompassing the head, so that the aid(s) are held lightly but firmly in place. The Pakistani baby and his mother appear to be more passive and tolerant of such contraptions than western counterparts. A more serious difficulty is that high power aids demand very well-fitting moulds to avoid feedback : a problem even for adults where the resources are available and an especial difficulty with children because of continuous growth of the ear canal. Very ear-level aids currently available are designed for mild/moderate impairment rather than severe/profound, for

this reason. Another objection to the ear-level aid is that the controls are so small that the child cannot easily learn to adjust it himself. However for the very young child adjustment would in any case be left to parents, teacher or fitting technician. In fact all controls and battery might be enclosed specifically in order to be inaccessible to the child in the early stages.

The technology exists to manufacture miniaturized aids that will stand up to rough usage in tropical climates. There are at least 6 million potential child customers for hearing aids in the developing countries, and probably at least as many adults. Unfortunately, mass-production techniques will not in the next few years greatly transform the economics, because much of the added value lies in testing, in precise component selection etc. However, the success of the miniature transistor radio (which has spread noise pollution and rumours of war to practically every remote village of the world) demonstrates that distribution can be achieved once problems of price and attitude can be solved.

b) Ear Mould. Great difficulty is still experienced by parents in Britain in 1982 in obtaining well fitting ear moulds for their children's hearing aids; so prospects for Pakistan are gloomy. Emphasis should be placed on developing a one-stage manufacturing process, where the impression taken of the ear becomes the ear mould after insertion of the appropriate tone tube and receiver clip. The advantages of simplifying manufacture are considerable for the growing child. Some research and development work in materials science is in progress on mould manufacture, but there is no simple answer yet. It does not however have the character of an intrinsically insuperable problem. Only money and effort are required.

c) Batteries. The button cell used in the ear-level aid has a considerable advantage over the penlight type in that it does not decline but goes sharply from live to dead, eliminating the need for assessing battery strength. The ideal battery would incorporate this feature, be very small, and would either be cheap or have a long life or be rechargeable from solar radiation. It should preferably be a type commonly used in other sorts of equipment.

Aid Maintenance and Parent Training

The founders of one school for the deaf in the Punjab, after training in U.K. and U.S.A., returned with a large number of hearing aids and proceeded with enthusiasm to teach their pupils by oral methods. After three years all the aids were broken, destroyed or otherwise unserviceable, and they switched to teaching methods that are not dependent on modern technology. Until aids can be manufactured at tolerable cost to be child-proof, dust-proof, buffalo-proof, water-proof, and capable of being serviced by a village electrician (who may in fact tinker with radios, televisions, calculators and digital watches), there seem to be only two choices : a) to abandon hearing aids (at least for children outside of the provincial capitals) and concentrate on manual methods of communication and promoting normal childhood development in areas other than hearing/speech; b) to sell subsidised hearing aids only to those children

whose parents display strong motivation and have successfully completed training in a daily maintenance/monitoring program.

There are parents, some of them quite poor and with little education, who will make remarkable efforts over a long period even to see quite modest benefit in their handicapped child. One man, a petty clerk who lives with his deaf wife in a bare shack, used to cycle six miles to us every day bringing one of his two profoundly deaf and severely retarded sons, and retrieving him after work. He must have realised that the boy was making barely perceptible progress, yet he was prepared to make the effort because he knew that the boy was happy at school. (He could not carry both sons because their balance is faulty and the traffic too dangerous). Had suitable aids been available and appropriate, that man would gladly have received instruction in their maintenance and would have carried it out punctiliously.

Many other parents would not make sufficient effort, and there would be little point in offering help. Adequate allowance must be made for the emotional state of the parents, psychological blocks towards any form of intervention with their child (other than total miraculous cure) and time must be granted for family consultations about investment in an aid with a course of training. Some will come through this period determined to make the necessary ongoing effort to maintain a hearing aid. For others, the initial financial outlay (even if subsidised), the continuing costs of batteries and servicing and the daily monitoring and cleaning, will be too much when taken in conjunction with initial resistance on the part of the child and the fact that the aid may make little immediate and obvious improvement in the child's behaviour or grasp of language, only showing benefits in the long term.

The mechanics of providing instruction in the care of hearing aids should not be beyond the capacity of any centre offering the other prerequisites for effective intervention with young hearing impaired children, provided that the necessity of doing so is firmly established, and there are sufficient number of well-motivated parents. The continuing effectiveness of such instruction will probably depend on the quality and extent of assistance provided to parents in their home-based efforts to guide their child into the optimal use of the hearing aid and the maximum linguistic development. Assistance may take the form of home visits by a suitable person, and a printed guide devised with crystal clarity and copious illustration enumerating the recommended activities.

Support for Home Training

Due to the rudimentary nature of organised social welfare services there is at present no form of regular home visiting by Government agencies to families in need. Assistance may be provided by relatives, but will rarely benefit the handicapped child. Relatives have the maximum opportunity and incentive to interfere, to claim knowledge where they have none, and to promote whatever myths and folk-remedies take their fancy. This underlines the need for follow-up and support of parents after a hearing aid has been supplied and they have

been instructed in care and monitoring performance. Instructions are otherwise quite likely to be overruled by a determined grandmother, uncle or cousin.

Home visitors, whether itinerant special teachers, community rehabilitation workers, social workers or primary health care agents, need to blend respect for the prevailing family hierarchy and sickness/health beliefs with yet a firm insistence on the right of the handicapped child to benefit fully from the hearing aid. (At this point the value of making every family contribute towards purchase of the aid becomes very clear). In many countries and with various disabilities it has been found that parents who have had a similar experience and a successful outcome with their own handicapped child are among the most effective counsellors and supporters of parents currently entering the battle. In some countries it is the midwife or birth attendant who has the confidence of the parents for subsequent health advice about the child. Attempting to involve these persons would be worth pilot investigation.

There is no reason why a home visiting and support scheme should not take place in Pakistan, though there are twenty reasons why such a scheme will be difficult to replicate widely. I have dealt with some of these in detail elsewhere in evaluating the W.H.O. Community Rehabilitation Scheme. The main problems are : 1) opposition from professionals and local communities preferring the status quo; 2) difficulty of finding suitable front-line personnel and of supervising and supporting them adequately and of retaining their services; 3) the stigma and myths surrounding handicaps, both among the general public and medical personnel; 4) illusory concepts of "cure" discouraging the acceptance of rehabilitative training. Notwithstanding the difficulties, such a scheme must accompany the supply of appropriate hearing aids to families with young impaired children, in order to reinforce aid usage/maintenance and parental efforts at stimulating language development. There would be little point in overcoming the considerable obstacles of identification, assessment, prescription and supply of an appropriately designed aid, training parents in aid maintenance, and then failing to follow up the effort by helping parents and child to make the best use of newly acquired hearing. It may be better to plan for a few centres offering a comprehensive service from which other can then learn the importance of all the components, rather than attempting screening in 1984, aids in 1987 and rehabilitation in 1990.

Parent - Professional Collaboration

Nowhere are rehabilitation professionals as a rule eager to collaborate with non-professionals. Pakistan, as other nations with a highly stratified society, is no exception. The few well-qualified and experienced professionals are disinclined to believe that unqualified laymen can do anything but harm. A larger group whose qualifications and experience are limited feel threatened by the possibility of parents taking an active part in rehabilitation, in case their own inadequacies are exposed and their status undermined. The career ladder to professional success hardly promotes humility in those at the top,

or in fact at any stage. Especially in the rehabilitation field, professionals are accustomed to public applause for their "noble humanitarian efforts", and are not easily persuaded to forego the plaudits, bring parents into the limelight, and supply the necessary expertise from the background. Unfortunately in a society which has no place for the handicapped except as beggars and which attaches a social stigma to the family of the handicapped person, the parents are often suffering from some degree of psychological and emotional disturbance. They are likely to be hypersensitive precisely concerning the rehabilitation of their child. Thus professionals and parents easily begin perceiving each other as part of the problem to be overcome, rather than as part of the solution. Unless they take great care, both are likely to be right !

The trained person best placed to work cooperatively with parents may be a middle-level professional, who has a substantial advantage of skill, knowledge and experience but is not so high-powered as to be remote or frightening. The middle level unfortunately is noticeably absent in every area of knowledge and skill in developing countries. The ideal would be a good technician who could use an audiometer, set and service a hearing aid, explain and demonstrate maintenance to parents, and answer questions. It is much more likely however in our rural target towns that hearing aids will be serviced by a radio or watch repairman who is little interested in counselling parents. Likewise audiometry may be carried out by a public health nurse working at the periphery of her knowledge and capability. In such circumstances the best thing parents can do is to organise themselves into associations to acquire and share as much expertise as possible and to press for better facilities. Gender dynamics also need to be considered, especially in parts of the country where gender roles are very firmly delineated. Doctors and technicians are almost all male; teachers of handicapped children and community health workers generally female; the parent having greater responsibility for the handicapped child is usually the mother. Difficulties of relationship between men and women arising from a tradition of sexual apartheid have their effect also on professional relations. Mutual help between families in an association may overcome some such barriers by enabling people to meet on a more relaxed personal level.

Strategies Compared

There is no shortage of deaf babies and children. The rural population continues to grow at about 3% per annum, outstripping the growth of educational, medical and rehabilitational facilities in rural areas. So the number of handicapped children should increase steadily for the foreseeable future. The Government is unable to induce unemployed doctors to move to rural areas where their services are needed; rural schools are staffed with difficulty, through lack of adequate remuneration and housing. It must be anticipated that once rehabilitation staff have been trained, they will be equally unwilling to work in rural areas.

In a rural town of 50,000 population there will be roughly 25,000 children up

to the age of 14. Taking a conservetive figure of 5 per 1,000 having insufficient hearing (unaided) to learn language by the normal means, there will be 125 such children in town. At least 10 will be born every year (of whom one or two will soon die). There will be at least twice that number with a hearing loss that does not prevent them learning their own language, but will impede them substantially in school and in social development. Thus in such a town at least 350 children are urgently in need of hearing rehabilitation, and possibly as many as 500. Current resources in the average rural town are nil so far as deaf schools, specialist teachers or hearing-specialised medical personnel are concerned. However, normal schools and the families of the hearing impaired may be counted as resources if the goal is to see the children integrated into the normal educational system and the normal life of society. This goal would eliminate the need for separate special deaf schooling with its expensive buildings, equipment and staff, its principle of segregation, and its very difficult task of repairing the damage done in the first few years of hearing-impaired life; and would instead utilise existing resources of family life and education, by pre-school intervention leading to integrated education.

Neither strategy would in fact come near benefitting as many as 50% of the children in need over the next ten years. However, a special schooling system is unlikely even to begin in most rural towns during that period; and if it were to begin its success would be largely dependent on the supply of skills and technology from outside, a large input of Government capital, and high continuing costs per child. The early intervention strategy could start more quickly and with smaller capital input, with costs per child diminishing to something like that for normal education, provided the technical requirements had been attained as outlined previously. Furthermore, while it is unlikely that special education for the deaf will become any easier or much more widespread during the next ten years, it is quite possible that there will be a greater availability of durable, miniaturised, sophisticated hearing aids. The large potential market for robust, tropicalised aids may tempt one of the big firms to invest in the necessary research. Alternatively, simple body-worn aids could be manufactured at reasonable cost in the client countries where labour is cheap. Apart from hearing assessment, hearing aids and servicing, the early intervention approach draws on existing community resources.

The major financial cost to families is for the aid and batteries. Costs in family time will be greater for a few years after purchase, and thereafter a great deal less than if the child were not given an aid. Most families in fact waste large amounts on quacks, medicines and travel to distant shrines or to specialists, for treatments rarely useful and often positively dangerous. The well-motivated parents who will maintain an aid properly and fulfil the objectives of their training in language stimulation are often the sort who can find money to purchase an aid. Most families in rural towns can raise money, if they wish to do so badly enough. There are of course a proportion of absolutely poor families :- but they do not get their children's hearing checked, nor expect their children to learn anything very much.

There are also local charitable organisations which act as a palliative to the sharp division between rich and poor, serving to redistribute a little wealth. Handicapped children are a popular target for philanthropy, and most individuals and organisations prefer to see their donation spent on visible equipment. These factors, i.e. charitable giving, family expenditure on visits to shrines and family borrowing to meet priority needs, represent a large slice of rehabilitation finance in rural areas but tend not to figure in cost calculations by Government or Aid agencies, which usually refer only to 'top-down' spending, notoriously inefficient compared with money raised locally for perceived needs.

Returning to the 350 children in the average target town : if 1% of them have parents with some drive and initiative and those parents form an association (involving also local health/welfare personnel), draw in a further 5%, pool their resources, approach the charities and lobby local government, then they should be able to get their children properly assessed, buy hearing aids and get a local technician trained in aid servicing. That 6%, i.e. 21 children, will be a convincing example of what can be done through local self-help to improve the lot of the hearing impaired.

Foreign Technical Assistance

Given the number of pressing development needs in Pakistan, the constant brain drain to countries with more advanced facilities, and the absence of an effective deaf pressure group, it is unlikely that the above suggestions will be taken up by Pakistani initiative alone. Foreign technical assistance, pump-primers and mobilisation will probably be needed to obtain any substantial advance.

The UNICEF policy towards handicapped children commendably emphasizes normal childhood development as far as possible with the handicapped child. This maximises use and development of abilities, rather than concentrating on disabilities, and gives the child the best hope of integrating with his non-handicapped peers. Similar considerations underlie the W.H.O. scheme, which sees the family as the primary agent towards normal development of the handicapped child, supported by village-level community rehabilitation workers. The UNICEF and W.H.O. approach needs to be firmly grounded in practical method, such as the detailed materials prepared for the Portage Early Education Project which have succeeded in training parents to carry out home rehabilitation not only in Portage, Wisconsin, but also in Jamaica and Peru, with peripatetic support workers.

The development of appropriate hearing aids and audiometers, and their manufacture (or at least assembly) in Pakistan will require foreign assistance, since ideal designs do not yet exist. There does not seem to be any audiological development in the offing that would undermine a ten-year strategy based on technology currently available in industrialised nations, suitably adapted. However, some vigilance may be required to prevent the off-loading of obsolete or inappropriate high technology onto the Third World. A different danger is the

unwillingness of both parents and professionals to undertake the hard work of rehabilitative training with available methods once they have read a garbled newspaper account of a miracle 'fix' just developed in the West (e.g. inner ear implants), which while being in fact still experimental and relevant only in a small number of cases is most distracting for parents.

Conclusion

Prospects for the majority of hearing impaired children in Pakistan remain poor, both in cities and rural areas. In practice this means a grossly traumatic childhood for the severely impaired; and an unjustified label of 'stupid','dumb' or 'difficult' for those with a mild loss. Factors which could make an impact are : 1) mobilisation of parents by giving them an important place in the rehabilitation team; 2) early intervention aiming to preserve the normal pattern of language acquisition and development, leading to integration of hearing impaired children into the normal educational system; 3) development and distribution of appropriately designed hearing aids for young children in unsophisticated conditions and climatic extremes.

None of these factors is likely to emerge from current activities in Pakistan for the hearing impaired. The alternative strategy merits coordinated experimental projects to be undertaken preferably by non-Government organisations involving parents and professionals, with support from international bodies, in order to minimise procedural delay and maximise the dissemination and practical application of useful results. (It may be added that this is no merely theoretical conclusion. A project is under way between a local welfare association and UNICEF to mobilise parents of all varieties of handicapped children in rural towns of the North West Frontier Province and to help them begin effective small-scale self-help rehabilitation projects with some assistance from rehabilitation professionals.)

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